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(19)



(54) HAND TOOL

- (71) We, WALTER ECKOLD
 VORRICHTUNGS - UND GERATEBAU
 SPERRLUTTERTAL, a body incorporated
 organised according to the laws of Germany of
 5 D3424 St. Andreasburg, Germany, do hereby
 declare the invention for which we pray that a
 patent may be granted to us, and the method
 by which it is to be performed, to be part-
 10 icularly described in and by the following
 statement:-
 This invention relates to a power-operable
 hand tool for folding down upright flange
 portions at the edges of metal or other tough
 sheet material. Normally, such upright flange
 15 portions will extend initially substantially at
 right angles to the remainder of the sheet.
 As is known, metal sheets in doors, ceilings
 and other structures are commonly joined
 together by folding back the edges. This folding
 20 back operation has hitherto been carried out
 with roller machines, presses or by knocking
 round by hand. Also, electromotively and
 pneumatically operated hand tools are known
 for pressing together sheet metal edge portions
 25 that are already folded back at an acute angle.
 Beating sheets together by hand is strenuous,
 time-consuming and very noisy. If roller
 machines and presses are used, the parts to be
 worked, which are often very bulky and heavy,
 30 have to be carried to the machine.
 It is an object of the invention to provide a
 mobile device with which sheet metal edges can
 be folded back on site so that it is no longer
 necessary to use the expensive roller machines
 35 and presses or to beat round by hand the
 upright sheet metal edges in order to fold them
 back.
 The invention provides a power-operable
 hand tool for folding down an upright flange
 40 portion at the edge of sheet material, which
 comprises a longitudinally extending jaw for
 supporting the underside of the sheet during
 said folding operation, an operating jaw
 pivotally mounted about an axis extending
 45 parallel to the longitudinal axis of the support

jaw, and having a main pressing surface cor-
 responding to the desired final profile of the
 folded flange, drive means for causing pivoting
 of the operating jaw, said drive means being
 connectable to a source of motive power 50
 therefor, wherein the end portion of the
 operating jaw remote from the main pressing
 surface is formed with a lug or rim capable of
 engaging over the edge of an upright flange
 portion to be folded down, the profile of the 55
 effective surface of the operating jaw from the
 lug to the main pressing surface being so curved
 or inclined that, when the tool is moved along
 the flange portion that is to be folded, each
 section of the flange is first engaged by the lug 60
 or rim and then progressively folded down by
 successive portions of the operating jaw.

Hand tools made according to the invention
 can provide the advantage that, as a result of
 the special shaping of the operating jaw, an 65
 upright flange portion at the edge of sheet
 material can be folded back in one operation by
 moving the tool, operating with a continuous
 stroke sequence, along the edge.

One form of hand tool according to the 70
 invention has a grip housing, and the drive
 means includes a drive rod, mounted in the
 grip housing, and arranged for automatic or
 manually-controlled sequence. The grip
 housing is preferably so designed that it permits 75
 the operating and/or support jaw to be changed
 to suit different thicknesses of sheet material
 and different fold shapes. The hand tool can be
 operated electrically, hydraulically or
 pneumatically. 80

A hand tool according to the invention may
 comprise a longitudinally extending supporting
 jaw for lying flat against the underside of the
 sheet metal and an operating jaw extending
 parallel thereto and drivable in a swivel 85
 movement about an axis parallel to the long-
 itudinal axes of the jaws, wherein there is
 provided, on one end of the operating jaw, a
 lug or rim that is engageable in the manner of
 a hook over an upright sheet metal edge, and 90

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adjoining this lug there is provided a curved or inclined folding back portion which continues into a main pressing surface of the operative jaw, the main pressing surface corresponding to the desired final profile of the folded flange.

One form of hand tool according to the invention will now be described, by way of example, with reference to the accompanying drawings, in which:—

- 10 Fig. 1 is a diagrammatic view of the hand tool, partly in longitudinal section;
 Fig. 2 is a plan view of the tool;
 Fig. 3 is a front view of the pressing jaws; and
 Fig. 4 is a diagrammatic perspective view showing the hand tool in operation.

Referring to the drawings, the hand tool has a grip housing 1, at the front of which a transmission arm 2 is mounted for rotation about an axis 3, and at the rear of which is a screw-mounted high-pressure hydraulic cylinder 4.

The piston stroke of the hydraulic cylinder 4 is transferred to the transmission arm 2 by means of a drive push rod 5. A stationary supporting jaw 6 and an operative jaw 7, which is pivotable back and forth in the direction of the arrow A (Fig. 1), are secured to the housing 1 and the transmission arm 2 respectively each by means of two screws. The set screws for the operative jaw 7 are indicated by 8 in Fig. 2. By means of a high pressure tube 9, the hand tool is connected to a hydraulic power source which is not shown. Accommodated in the hand grip 10 is an electroswitch 11 for activating an individual or continuous stroke of the operative jaw 7.

The method of operation of the described hand tool is as follows:

The tool is held in both hands (on the housing and on the hand grip 10) and advanced to the sheet metal edge 12 that is to be folded back. When the switch 11 is pressed, the hydraulic cylinder 4 is actuated, and the operative jaw 7 is thereby pivoted towards the upright sheet metal edge 12 to be folded back. The folding process is started by the lug 13 on the leading end of the hand tool, which engages over the sheet metal edge while still vertical. The curved or inclined portion next to the lug 13 and the immediately adjacent supplementary folding-back portion 14 (see Fig. 4) have the effect, on pivoting of the jaw 7, of folding back the raised edge 12 in the desired direction. The sheet metal edge 12 is then folded back parallel to the sheet 18 (Fig. 4), or against a folded edge 16 of a fastening sheet 17 (Fig. 1), by means of the following plane section 15 of the operative jaw. Thus, the folding back of the sheet metal edge is initiated by the lug 13, and is completed by the following flat pressing surface 15 of the jaw 7.

Depending on the shape of the jaws it is

possible also to produce round or curved folded joints in essentially the same manner.

WHAT WE CLAIM IS:—

1. A power-operable hand tool for folding down an upright flange portion at the edge of sheet material, which comprises a longitudinally extending jaw for supporting the underside of the sheet during said folding operation, an operating jaw pivotally mounted about an axis extending parallel to the longitudinal axis of the support jaw, and having a main pressing surface corresponding to the desired final profile of the folded flange, drive means for causing pivoting of the operating jaw, said drive means being connectable to a source of motive power therefor, wherein the end portion of the operating jaw remote from the main pressing surface is formed with a lug or rim capable of engaging over the edge of an upright flange portion to be folded down, the profile of the effective surface of the operating jaw from the lug to the main pressing surface being so curved or inclined that, when the tool is moved along the flange portion that is to be folded, each section of the flange is first engaged by the lug or rim and then progressively folded down by successive portions of the operating jaw.

2. A hand tool according to claim 1, wherein said drive means includes a drive rod mounted in a grip housing.

3. A hand tool according to claim 2, which includes means for enabling said drive rod to be operated in a manually or automatically controlled sequence.

4. A hand tool according to any one of claims 1 to 3, wherein the drive means is operable by fluid under pressure.

5. A hand tool according to any one of claims 1 to 4, wherein at least one of the jaws is exchangeable.

6. A hand tool according to any one of claims 1 to 5, wherein the main pressing surface is planar.

7. A hand tool according to any one of claims 1 to 6, which is capable of working metal sheet material.

8. A power-operable hand tool for folding down an upright flange portion at the edge of sheet metal, comprising a longitudinally extending supporting jaw for lying flat against the underside of the sheet metal and an operating jaw extending parallel thereto and drivable in a swivel movement about an axis parallel to the longitudinal axes of the jaws, wherein there is provided, on one end of the operating jaw, a lug or rim that is engageable in the manner of a hook over an upright sheet metal edge, and adjoining this lug there is provided a curved or inclined folding back portion which continues into a main pressing surface of the operative jaw, the main pressing

surface corresponding to the desired final
profile of the folded flange.

9. A hand tool substantially as hereinbefore
described with reference to, and as shown in,
5 the accompanying drawings.

ABEL & IMRAY
Chartered Patent Agents,
Northumberland House,
303-306 High Holborn,
London WC1V 7LH

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2 SHEETS

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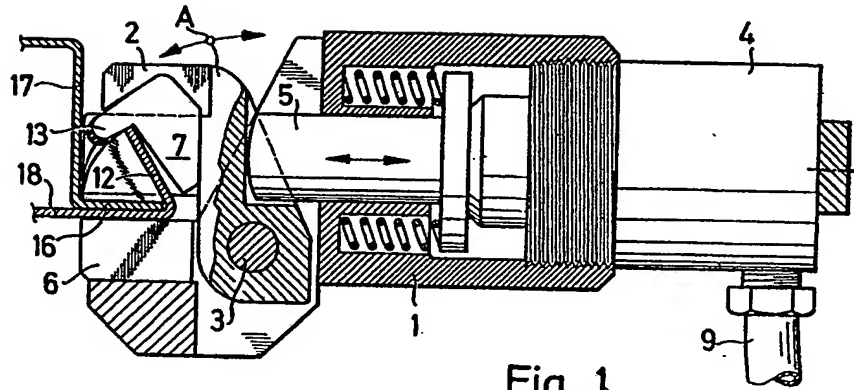


Fig. 1

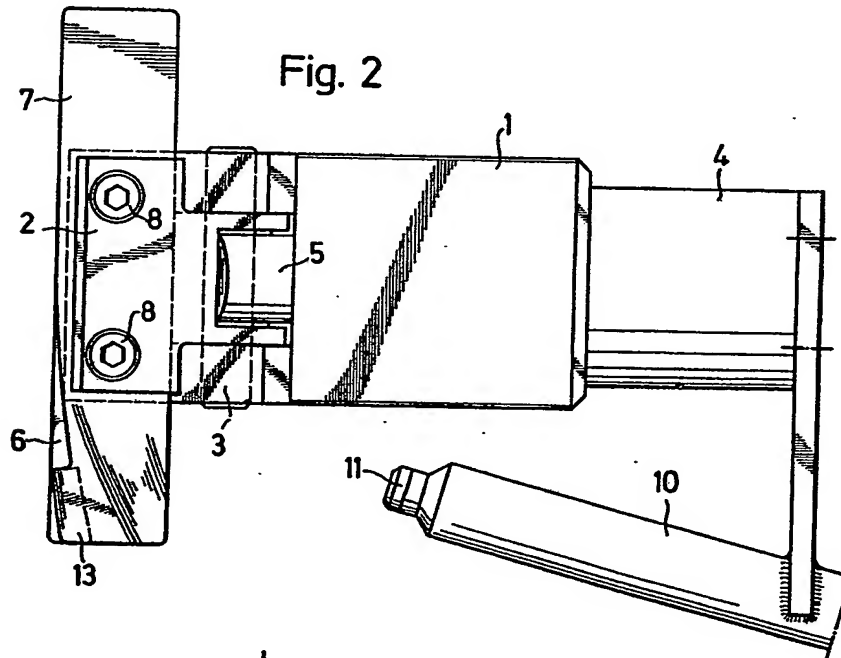


Fig. 2

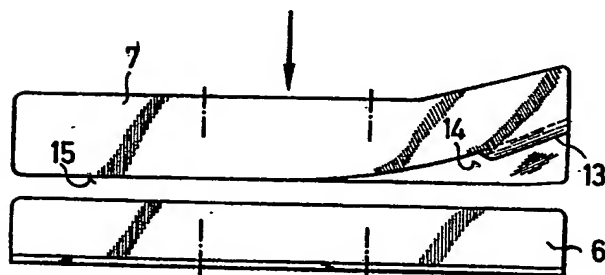


Fig. 3

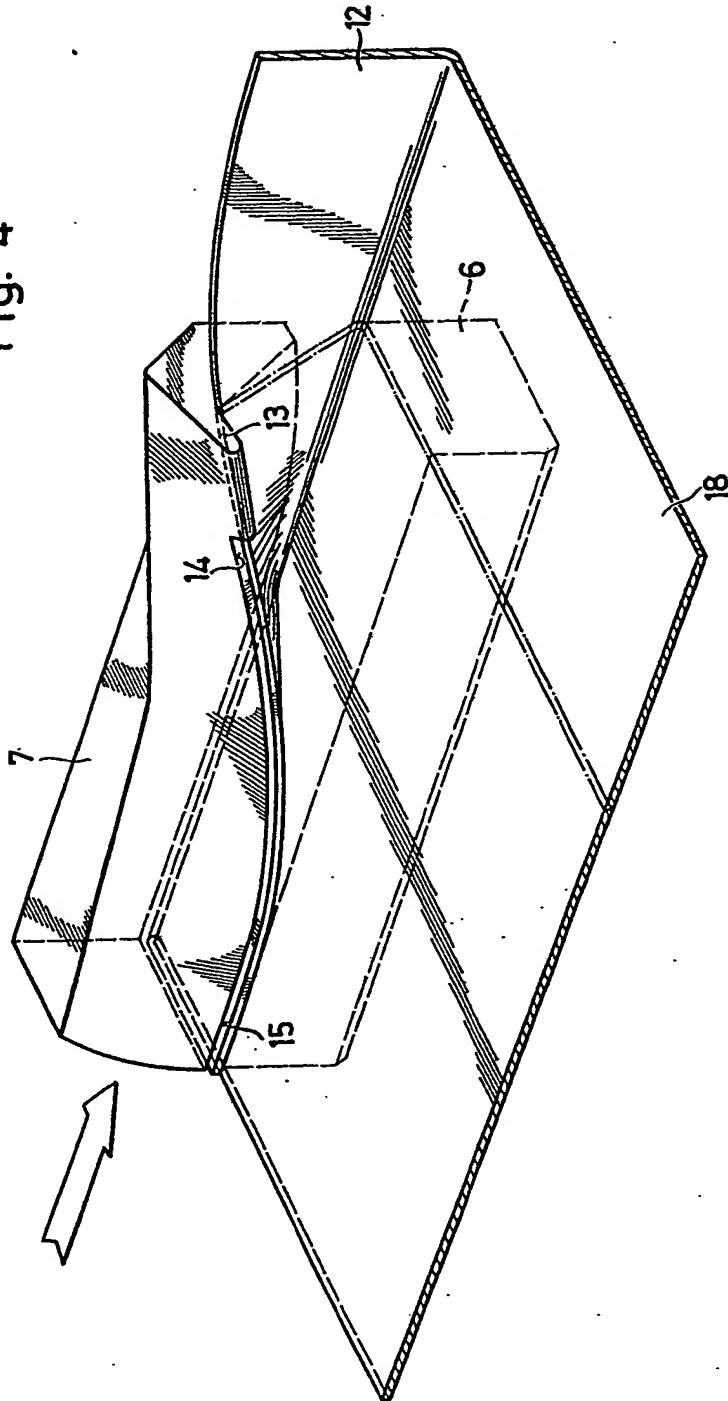
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SHEET 2

Fig. 4



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